

Exit Competencies for Trigonometry
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The following competencies are generally expected by all institutions:

- 1) Understand the geometric concepts of angle (e.g. initial side, terminal side, coterminal angles, degree, radian, central angle, circular arc length, circular sector area, and reference angle) and be able to apply appropriate properties.
- 2) Understand the concepts of the six trigonometric functions, both in terms of a unit circle and a right triangle, and be able to apply such knowledge.
- 3) Understand the inter-relationships among the six trigonometric functions, including the Pythagorean Identities, and be able to express one in terms of another appropriately.
- 4) Understand the graphs of the six trigonometric functions and be able to recognize and apply such knowledge (including incorporation of appropriate transformations: shifting, reflecting, stretching, and shrinking, and the knowledge of period, phase shift, and amplitude).
- 5) Understand the general nature of proving trigonometric identities and be able to perform such task appropriately.
- 6) Understand the general nature of trigonometric equations and be able to solve such equations whenever appropriate.
- 7) Be familiar with useful formulas (e.g. addition and subtraction, double-angle, half-angle, product-to sum, sum-to-product, law of sines, law of cosines, and Heron's) and able to use them appropriately.
- 8) Understand the concepts and graphs of inverse trigonometric functions and their related properties, and be able to perform appropriate operations.
- 9) Be able to use trigonometry to model and solve basic applied problems.

The following competencies are based on the elective topics (vary from institution to institution):

- 1) Understand the trigonometric form and its geometric interpretation for complex numbers, and be able to recognize and perform basic conversions.
- 2) Understand the multiplication and division of complex numbers in trigonometric form and their respective geometric interpretation.
- 3) Understand De Moivre's Theorem and its geometric interpretation, and be able to apply the concept to find roots of complex numbers.
- 4) Understand the basic concepts and operations of two-dimensional vectors, their respective geometric interpretation, and the trigonometric aspect of the inner (dot) product, and be able to apply the knowledge to related problems.